



Cisco 1700 Router Hardware Installation Guide

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

Customer Order Number: DOC-785405=
Text Part Number: 78-5405-03



THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: The equipment described in this manual generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

Modifying the equipment without Cisco's written authorization may result in the equipment no longer complying with FCC requirements for Class A or Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StrataView Plus, TeleRouter, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0502R)

Cisco 1700 Router Hardware Installation Guide

Copyright © 2005 Cisco Systems, Inc. All rights reserved.



About This Guide ix

Audience and Scope ix

Organization x

Related Publications x

Conventions xi

Obtaining Documentation xiv

Cisco.com xiv

Documentation DVD xiv

Ordering Documentation xv

Documentation Feedback xv

Cisco Product Security Overview xv

Reporting Security Problems in Cisco Products xvi

Obtaining Technical Assistance xvii

Cisco Technical Support Website xvii

Submitting a Service Request xviii

Definitions of Service Request Severity xviii

Obtaining Additional Publications and Information xix

CHAPTER 1

Cisco 1700 Router Overview 1-1

Key Features 1-3

Rear-Panel Ports and LEDs 1-4

Front-Panel LEDs 1-6

Router Memory 1-8

Types of Memory 1-8

Amounts of Memory	1-9
Unpacking the Router	1-10
Additional Required Equipment	1-10

CHAPTER 2

Installing the Cisco 1700 Router 2-1

Before Installing the Router	2-1
Connecting the Router to Your Local Network	2-2
Installing WAN Interface Cards	2-4
Safety Information	2-4
Installing a WAN Interface Card	2-5
Connecting Power to the Router	2-8
Verifying Your Installation	2-10
Optional Installation Steps	2-11
Connecting a PC	2-11
Connecting a Modem	2-12
Wall-Mounting	2-14

CHAPTER 3

Troubleshooting 3-1

Contacting Cisco or Your Reseller	3-1
Recovering a Lost Password	3-2
Change the Configuration Register	3-2
Reset the Router	3-4
Reset the Password	3-5
Reset the Configuration Register Value	3-6
Problem Solving	3-6
OK LED Diagnostics	3-7
Troubleshooting WAN Interface Cards and Cables	3-7
Troubleshooting the Power System	3-9

Troubleshooting ISDN 3-10

APPENDIX A**Technical Specifications A-1**

APPENDIX B**Cabling Specifications B-1**

Ethernet Cables B-2

Ethernet Network Cabling Guidelines B-3

Console Cable and Adapters B-3

APPENDIX C**Installing and Upgrading Router Memory C-1**

Opening the Chassis C-2

Locating Memory C-4

Installing a Mini-Flash Module C-5

Removing a Mini-Flash Module C-6

Installing a DIMM C-7

Closing the Chassis C-8

APPENDIX D**Ordering and Configuring an ISDN Line D-1**

ISDN BRI Line Configuration Requirements D-1

ISDN BRI Switch Types D-2

ISDN BRI Provisioning by Switch Type D-3

Defining ISDN Service Profile Identifiers D-4

ISDN Configuration Options D-5

Snapshot Routing D-5

Dial-on-Demand Routing D-6

Bandwidth on Demand and Dial Backup D-6



About This Guide

This section discusses the intended audience, scope, and organization of the *Cisco 1700 Router Hardware Installation Guide* and defines the conventions used to convey instructions and information.

Cisco documentation and additional literature are available on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** in the toolbar, and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

Audience and Scope

This guide is for users who have some experience installing and maintaining networking hardware. We assume that Cisco 1700 router users are familiar with the terminology and concepts of local Ethernet and wide-area networking.

This guide describes the functional and physical features of the Cisco 1700 router and provides installation procedures, troubleshooting information, technical specifications, and cable and connector guidelines and specifications.

Organization

This guide is organized as follows:

- The chapter [“Cisco 1700 Router Overview”](#) describes the router features and describes the front-panel LEDs, rear-panel LEDs, and connectors.
- The chapter [“Installing the Cisco 1700 Router”](#) describes how to install the router by connecting cables, power, and installing WAN interface cards.
- The chapter [“Troubleshooting”](#) describes some problems that you might have with the router and how to solve these problems.
- The appendix [“Technical Specifications”](#) lists the physical characteristics, environmental requirements, and power specifications for the router.
- The appendix [“Cabling Specifications”](#) lists the physical characteristics of the cables and connectors used with the router.
- The appendix [“Installing and Upgrading Router Memory”](#) describes how to upgrade existing memory or install new memory in your router.
- The appendix [“Ordering and Configuring an ISDN Line”](#) describes how to order and configure ISDN line so that it will operate with your Cisco 1700 router.

Related Publications

The following publications provide related information on this product:

- *Installing Your Cisco 1700 Router* is the quick-start guide that came with your router. It has instructions for quickly cabling the router, installing WAN interface cards, and powering up the router.
- *Cisco 1700 Router Software Configuration Guide* describes some common network scenarios and how to use the Cisco IOS command-line interface (CLI) to configure the router in these scenarios.
- *Cisco WAN Interface Cards Hardware Installation Guide* describes how to install and configure all the WAN interface cards that are supported by the Cisco 1700 router.

- Cisco IOS command reference and configuration guides provide complete information about all Cisco IOS CLI commands and how to use them, as well as information on designing and configuring local and wide-area networks.

Conventions

This guide uses the following conventions for instructions and information:



Note

This note symbol means reader take note. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

This caution symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Warning

This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.



Warning

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.



Warning

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).



Warning

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.



Warning

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.



Warning

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.



Warning

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.



Warning

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.



Warning

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.



Warning

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation DVD

Cisco documentation and additional literature are available in a Documentation DVD package, which may have shipped with your product. The Documentation DVD is updated regularly and may be more current than printed documentation. The Documentation DVD package is available as a single unit.

Registered Cisco.com users (Cisco direct customers) can order a Cisco Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

Cisco Marketplace:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpc/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:
<http://www.cisco.com/en/US/partner/ordering/>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can send comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.

- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com
- Nonemergencies—psirt@cisco.com



Tip

We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list:

<http://pgp.mit.edu:11371/pks/lookup?search=psirt%40cisco.com&op=index&exact=on>

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year, at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

<http://www.cisco.com/ipj>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>



Cisco 1700 Router Overview

This chapter introduces the Cisco 1700 router, also referred to in this guide as the router, and covers the following topics:

- [Key Features](#)
- [Rear-Panel Ports and LEDs](#)
- [Front-Panel LEDs](#)
- [Router Memory](#)
- [Unpacking the Router](#)
- [Additional Required Equipment](#)

Cisco 1700 Router



Key Features

The Cisco 1700 router is a small, modular desktop router that links small- to medium-size remote Ethernet and FastEthernet LANs over one to four WAN connections to regional and central offices. lists the router key features.

Figure 1-2 **Key Features**

Feature	Description
One FastEthernet (10/100BaseTX) port	• Operates in full- or half-duplex mode (with manual override available). • Supports autosensing for 10- or 100-Mbps operation.
Two Cisco WAN interface card slots	• Supports a combination of any two of the following WAN interface cards: ISDN BRI, 56-kbps DSU/CSU, FT1/T1 DSU/CSU, high-speed serial, and dual-serial. • The WAN interface configuration can be changed as your network requirements change.
Console port	Supports router configuration and management with a directly-connected terminal or PC. Supports up to 115.2 kbps.
Auxiliary port	Supports modem connection to the router, which can be configured and managed from a remote location. Supports up to 115.2 kbps.
SNMP support	Router can be managed over a network using Simple Network Management Protocol (SNMP).
AutoInstall support	Configuration files can be easily downloaded to the router over a WAN connection.
Kensington security slot	Router can be secured to a desktop or other surface using Kensington lockdown equipment.
Cisco ConfigMaker support	You can set up networks that include the Cisco 1700 router using the Cisco ConfigMaker application, a wizards-based software tool that helps you easily configure and address Cisco routers, access servers, hubs, switches, and networks.
Compatible with Cisco Networked Office stack	Can be stacked and operated with other members of the Cisco Networked Office stack product line.
Support for Cisco IOS software features	Supports IP, IPX, AppleTalk, IBM, Open Shortest Path First (OSPF), NetWare Link Services Protocol (NLSP), Resource Reservation Protocol (RSVP), encryption, network address translation, and the Cisco IOS Firewall Feature Set.

Rear-Panel Ports and LEDs

This section describes the router rear panel ports and LEDs, which are shown in [Figure 1-3](#) and described in [Table 1-1](#) and [Table 1-2](#).

Figure 1-3 *Rear-Panel Ports and LEDs*

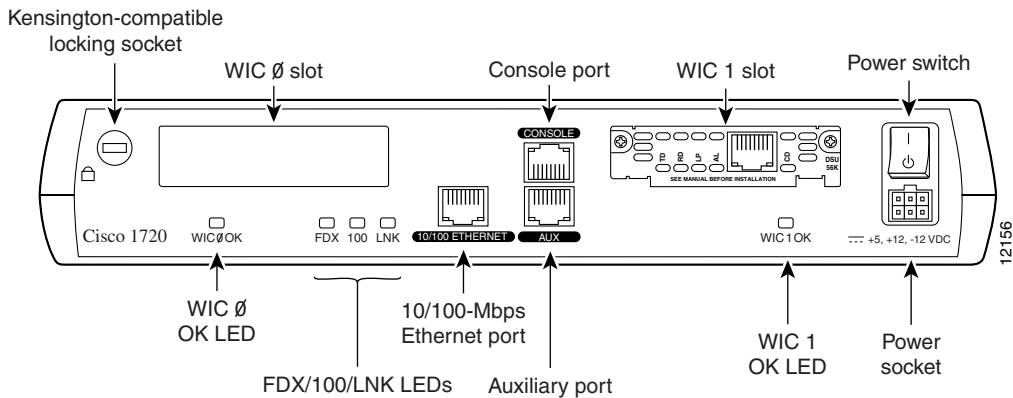


Table 1-1 *Rear-Panel Connectors*

Connector/Slot	Label/Color	Description
Ethernet port	10/100 ETHERNET (yellow)	Connects the router to the local Ethernet network through this port. This port autosenses the speed (10 Mbps or 100 Mbps) and duplex mode (full- or half-) of the device to which it is connected and then operates at the same speed and in the same duplex mode.
Auxiliary port	AUX (black)	Connects to a modem for remote configuration with Cisco IOS software.
Console port	CONSOLE (blue)	Connects to a terminal or PC for local configuration using Cisco IOS software.
WAN interface card slot (WIC0)	No label	Supports one Cisco WAN interface card. For detailed information, refer to the <i>Cisco WAN Interface Cards Hardware Installation Guide</i> that comes with every card.

Table 1-1 **Rear-Panel Connectors (Continued)**

Connector/Slot	Label/Color	Description
WAN interface card slot (WIC1)	No label	Supports one Cisco WAN interface card. For detailed information, refer to the <i>Cisco WAN Interface Cards Hardware Installation Guide</i> that comes with every card.
Power socket	+5, +12, -12 VDC	Connects the router to the external power supply.

Use the rear-panel LEDs during router installation to confirm that you have correctly connected all cables to the router.

Table 1-2 **Rear-Panel LEDs**

LED Label	Color	Description
WICØ OK	Green	On when a WAN interface card is correctly inserted in the card slot.
FDX	Green	On solid—Ethernet port is operating in full-duplex mode. Off—Ethernet port is operating in half-duplex mode.
100	Green	On solid—Ethernet port is operating at 100 Mbps. Off—Ethernet port is operating at 10 Mbps.
LNK	Green	On when the Ethernet link is up.
WIC1 OK	Green	On when a WAN interface card is correctly inserted in the card slot.

Front-Panel LEDs

Use the router front-panel LEDs to determine network activity and status on the Ethernet port and on the WAN interface card ports. The front-panel LEDs are illustrated in [Figure 1-4](#) and described in [Table 1-3](#).

Figure 1-4 Front-Panel LEDs

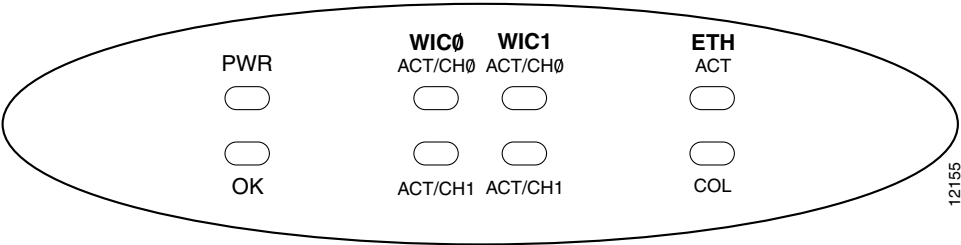


Table 1-3 Front-Panel LEDs

LED Label	Color	Description
PWR	Green	On means that DC power is being supplied to the router.
OK	Green	On means that the router has successfully booted up and the software is functional. This LED blinks during the power-on self-test (POST). Refer to Table 3-1 in the “ Troubleshooting ” chapter for information on how to use this LED for router diagnostics.
ETH		
ACT	Green	Blinks when there is network activity on the Ethernet port.
COL	Yellow	Blinks when there are packet collisions on the local Ethernet network.

Table 1-3 **Front-Panel LEDs (Continued)**

LED Label	Color	Description
WIC0		
ACT/CH0	Green	Serial and DSU/CSU cards—Blinks when data is being sent to or received from the port on the card in the WIC0 slot.
		ISDN cards—On solid when the first ISDN B channel is up for the card in the WIC0 slot.
		2-port serial cards—Blinks when there is data being sent to or received from the first port on the 2-port card in the WIC0 slot.
ACT/CH1	Green	Serial and CSU/DSU cards—Remains off.
		ISDN cards—On solid when the second ISDN B channel is up for the card in the WIC0 slot
		2-port serial cards—Blinks when there is data being sent to or received from the second port on the 2-port card in the WIC0 slot.
WIC1		
ACT/CH0	Green	Serial and DSU/CSU cards—Blinks when data is being sent to or received from the port on the card in the WIC1 slot.
		ISDN cards—On solid when the first ISDN B channel is up for the card in the WIC1 slot.
		2-port serial cards—Blinks when there is data being sent to or received from the first port on the 2-port card in the WIC1 slot.
ACT/CH1	Green	Serial and DSU/CSU cards—Remains off.
		ISDN cards—On solid when the second ISDN B channel is up for the card in the WIC1 slot.
		2-port serial cards—Blinks when there is data being sent to or received from the second port on the 2-port card in the WIC1 slot.

Router Memory

This section describes the types of memory stored in the router and how to find out how much of each type of memory is stored in the router.

For instruction on how to upgrade memory in the router, refer to the [“Installing and Upgrading Router Memory”](#) appendix later in this guide.

Types of Memory

The Cisco 1700 router has the following types of memory:

- **Dynamic random-access memory (DRAM)**—This is the main storage memory for the router. DRAM is also called working storage and contains the dynamic configuration information. The Cisco 1700 router stores a working copy of Cisco IOS software, dynamic configuration information, and routing table information in DRAM.
- **Nonvolatile random-access memory (NVRAM)**—This type of memory contains a backup copy of your configuration. If the power is lost or the router is turned off, this backup copy enables the router to return to operation without reconfiguration.
- **Flash memory**—This special kind of erasable, programmable memory contains a copy of the Cisco IOS software. The Flash memory structure can store multiple copies of the Cisco IOS software. You can load a new level of the operating system in every router in your network and then, when convenient, upgrade the whole network to the new level. The Flash memory on the Cisco 1700 router is stored on mini-Flash modules.

Amounts of Memory

Use the **show version** command to view the amount of DRAM, NVRAM, and Flash memory stored in your router. The following example of the **show version** command output in bold text displays the amount of memory stored in this router.

```
1700# show version
Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-Y-M), Version
12.X(XX)T
[cisco-ferrari2 121]
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Tue 26-May-98 19:58 by . . .
.
.
.
cisco 1700 (MPC860) processor (revision 0x00) with
12288K/4096K bytes of memory.
Processor board ID 0000 (1314672220), with hardware
revision 0000
M860 processor: part number 0, mask 32
Bridging software.
X.25 software, Version 3.0.0.
1 Serial network interface(s)
32K bytes of non-volatile configuration memory.
4096K bytes of processor board System flash
(Read/Write)
Configuration register is 0x0
.
.
.
```

Unpacking the Router

[Table 1-4](#) lists the items that come with your router. All these items are in the accessory kit that is inside the box that your router came in.

Table 1-4 Router Box Contents

• Power cord (black)
• Power supply
• DB-25 to DB-9 adapter
• Console cable, RJ-45 to DB-9 (light blue)
• Product documentation

Additional Required Equipment

Depending on your local network and which Cisco WAN interface cards you install in your router, you will require other items, listed in [Table 1-5](#), to complete your router installation.

Table 1-5 Additional Required Equipment

Equipment	When You Use It
Ethernet hub	A hub connects pieces of network equipment (including the Cisco 1700 router) to create a network. You can use a 10-, 100-, or 10/100-Mbps hub with the Cisco 1700 router.
Ethernet switch	A switch connects pieces of network equipment (including the Cisco 1700 router) to create a network. You can use a 10-, 100-, or 10/100-Mbps switch with the Cisco 1700 router.
Phillips screwdriver	Although the WAN interface cards use thumbscrews, you might need a Phillips screwdriver to loosen the WAN interface card slot cover.

Equipment	When You Use It
Cisco WAN interface card	In order to make a WAN connection, the Cisco 1700 router must have a supported WAN interface card installed. The router supports up to two cards. You can order the cards when ordering the router, and they will be installed for you. You can order the cards separately, after receiving the router, and install them yourself.
Straight-through RJ-45-to-RJ-45 cable	This cable connects the router to the Ethernet LAN and the WAN interface cards to various WAN services, including ISDN, T1/FT1, and 56-kbps services. You will need one cable for each connection that requires this cable type.
Serial cable	This cable connects a serial card to serial services. You must order this cable from Cisco. For detailed information about serial cable types, refer to the <i>Cisco WAN Interface Cards Hardware Installation Guide</i> that comes with every card.
NT1	Some ISDN service providers require a Network Termination 1 device to connect an ISDN S/T port to the ISDN line.
Asynchronous modem	Connect a modem to the AUX port on the router when you want to configure the router from a remote location.



Installing the Cisco 1700 Router

This chapter of installation procedures for the Cisco 1700 router includes the following sections:

- [Before Installing the Router](#)
- [Connecting the Router to Your Local Network](#)
- [Installing WAN Interface Cards](#)
- [Connecting Power to the Router](#)
- [Verifying Your Installation](#)
- [Optional Installation Steps](#)

Before Installing the Router

The Cisco 1700 router is shipped ready for desktop mounting. Before making the power and network connections, simply set the router on a desktop, shelf, or other flat surface.



Note

For instructions on wall-mounting the router, refer to the [“Wall-Mounting”](#) section later in this chapter.

Be sure to read the safety information in the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with your router.

**Warning**

Read the installation instructions before you connect the system to its power source.

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity.

**Caution**

Do not place anything on top of the router that weighs more than 10 pounds (4.5 kgs). Excessive weight on top of the router could damage the chassis.

Connecting the Router to Your Local Network

The Cisco 1700 router is connected to your local Ethernet network through the yellow 10/100 Ethernet port. You must provide the following items for this connection:

- A straight-through, RJ-45-to-RJ-45, Ethernet cable
- A 10/100-Mbps Ethernet hub or switch

**Warning**

The ports labeled 10/100 ETHERNET and CONSOLE are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because BRI circuits are treated like telephone-network voltage, avoid connecting the SELV circuits to the telephone network voltage (TNV) circuits. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with the router.)

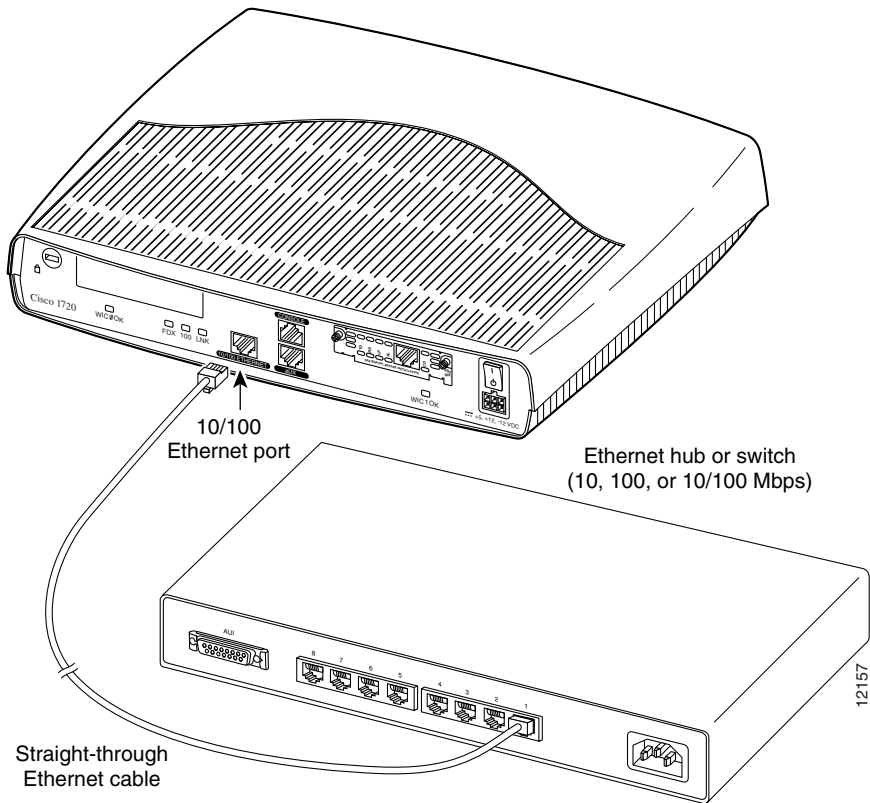
**Caution**

Always connect the Ethernet cable to the yellow ports on the router. Do not connect the cable to an ISDN S/T or U port (on a WAN interface card) or to an NT1 that is connected to a WAN interface card. Accidentally connecting the cable to the wrong port can damage your router.

Follow these steps to connect the router to the local network:

- Step 1** Connect one end of the cable to the yellow Ethernet port (labeled 10/100 ETHERNET).
- Step 2** Connect the other end of the cable to a network port on the hub or switch.

Figure 2-1 *Connecting the Router to the Local Network*



Installing WAN Interface Cards

The Cisco 1700 router supports one or two Cisco WAN interface cards. Each card has one or two WAN ports. This section describes the general procedure for installing a card in the Cisco 1700 router.

**Note**

For details on specific WAN interface cards, how to connect the card to the WAN line, and how to configure the interface with Cisco IOS software, refer to the *Cisco WAN Interface Cards Hardware Installation Guide* that came with the card(s).

Safety Information

This section lists safety warnings that you should be aware of before installing WAN interface cards in the router.

**Warning**

Only trained and qualified personnel should be allowed to install or replace this equipment. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with the router.)

**Warning**

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with the router.)

**Warning**

Before opening the chassis, disconnect the telephone-network cables (from the card) to avoid contact with the telephone-network voltages. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with the router.)

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for the Cisco 1700* document that came with the router.)

**Caution**

Do not connect a WAN cable to the card until you have completed the installation procedure.

Installing a WAN Interface Card

This section describes how to install WAN interface cards in the router.

Installing the Cards in Correct Sequence

The Cisco 1700 router discovers interfaces on WAN interface cards installed in the WIC0 slot before it discovers those installed in the WIC1 slot. This can affect your router configuration. This section describes how to ensure that your existing router configuration is not affected when you install WAN interface cards.

If you are installing a WAN interface card in the router for the first time, install the card in the WIC0 slot to ensure that your software configuration will not be affected if you install a second card at a later time.

If you are installing a second WAN interface card in a Cisco 1720 that has a card installed in the WIC1 slot, follow this general procedure to prevent having to reconfigure your router:

**Caution**

Read the instructions in the following section, “[Installing the Cards](#),” before installing the cards.

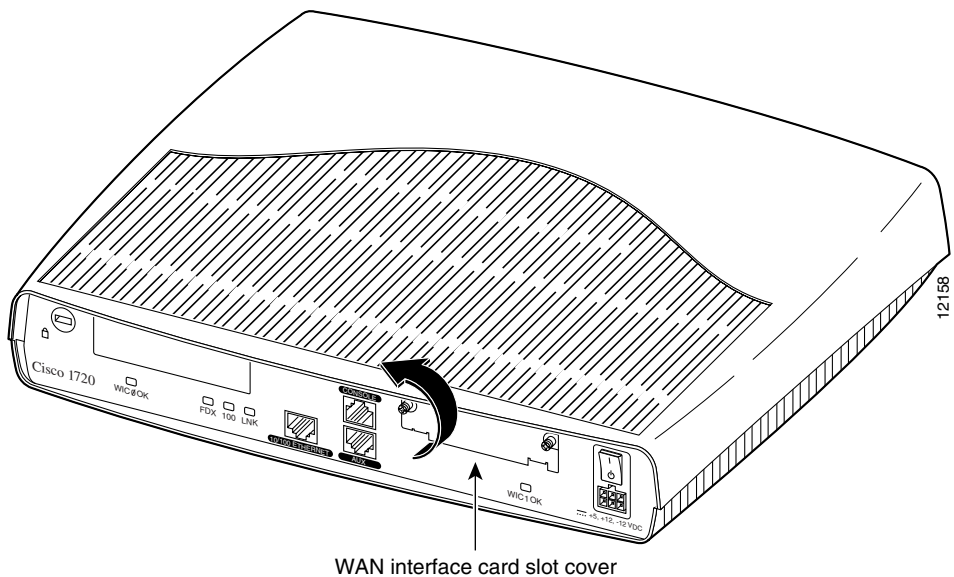
- Step 1** Remove the installed card from the WIC1 slot.
- Step 2** Reinstall the card (removed in Step 1) in the WIC0 slot.
- Step 3** Install the new card in the WIC1 slot.

Installing the Cards

Follow these steps to install the card in a Cisco 1700 router:

- Step 1** Make sure that the power switch is set to the STANDBY position () and that the power cable is not connected to the power socket on the rear panel.
- Step 2** Loosen the thumbscrews on the WAN interface card-slot cover on the rear panel, as shown in [Figure 2-2](#).
- You should be able to loosen the screws using your fingers; however, if the screws are very tight, you might need to use a Phillips screwdriver.

Figure 2-2 *Removing the WAN Interface Card-Slot Cover*

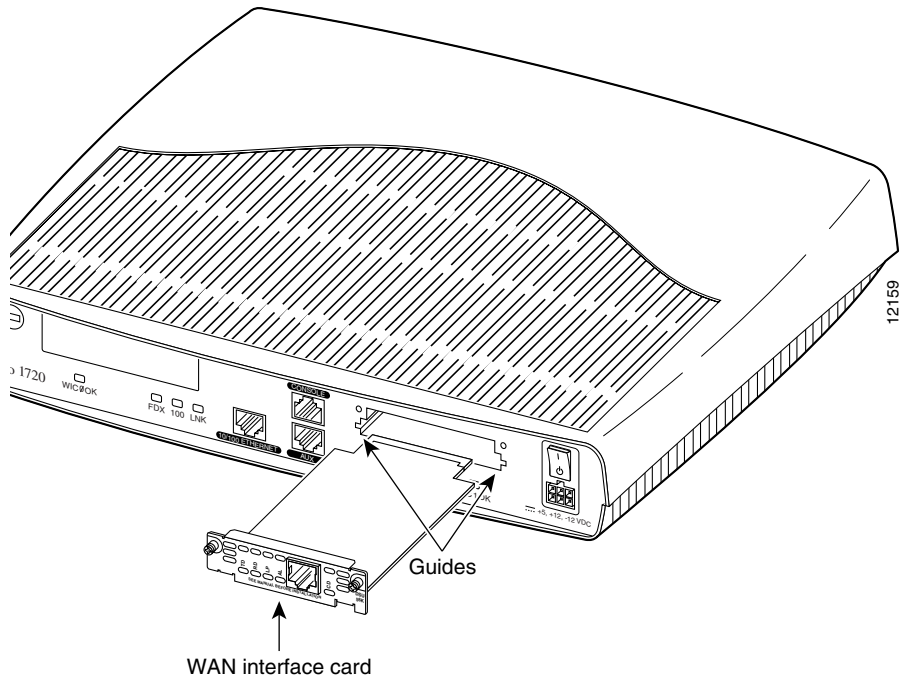


- Step 3** Remove the metal plate that covers the card slot.
- Step 4** Hold the WAN interface card by the edges on either side of the card front panel, and line up the card edges with the guides inside the card slot, as shown in [Figure 2-3](#).

Step 5 Insert the card in the slot and gently push it into the router until the front panel of the card is flush with the rear panel of the router.

Step 6 Tighten the screws.

Figure 2-3 *Inserting a WAN Interface Card in the Router*



Connecting Power to the Router

Read the following warnings before connecting the router to power.



Warning

The power supply is designed to work with TN power systems.



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120VAC, 15AU.S. (240VAC, 16A international) is used on the phase conductors (all current-carrying conductors).



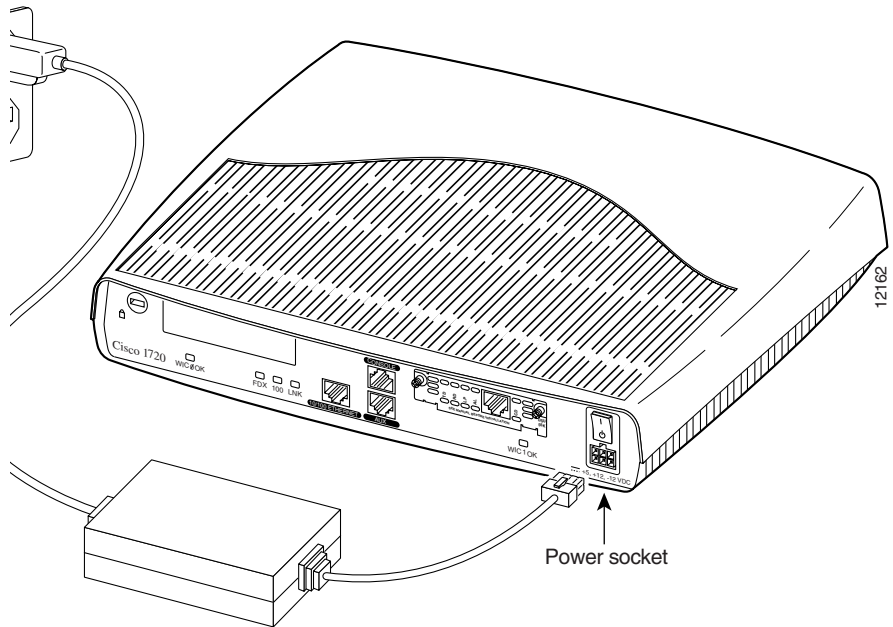
Warning

This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.

Take the following steps to connect power to the router and to turn the router on:

- Step 1** Connect the attached power-supply cord to the power socket (labeled +5,+12,-12 VDC) on the router rear panel.
- Step 2** Connect one end of the separate power cord to the socket on the power supply.
- Step 3** Connect the other end of the separate power cord to a power outlet.
- Step 4** Press the router power switch to ON (I).
- Step 5** Confirm that the router has power by checking that the PWR LED on the front panel is on.

Figure 2-4 **Connecting the Power Supply**



Verifying Your Installation

You can verify that you have correctly installed the router by checking the following LEDs:

- PWR (front panel)—On when power is being supplied to the router.
- OK (front panel)—On when the router software is loaded and functional. Blinking means that the router is performing a power-on self-test (POST).
- WICØ/WIC1 OK (rear panel)—On when a WAN interface card is correctly installed in the corresponding WAN interface card slot.
- ETH ACT (front panel)—Blinking when there is network traffic on the local Ethernet LAN.
- WICØACT or WIC1 ACT (front panel)—Varies depending on the WAN interface card installed. Refer to [Table 1-3](#) in the “[Cisco 1700 Router Overview](#)” chapter.
- LNK (rear panel)—On when the router is correctly connected to the local Ethernet LAN through the 10/100 ETHERNET port.

Optional Installation Steps

This section describes some installation steps that you might or might not use, depending on your site and how you are configuring the router. This chapter describes the following procedures:

- [Connecting a PC](#)
- [Connecting a Modem](#)
- [Wall-Mounting](#)

Connecting a PC

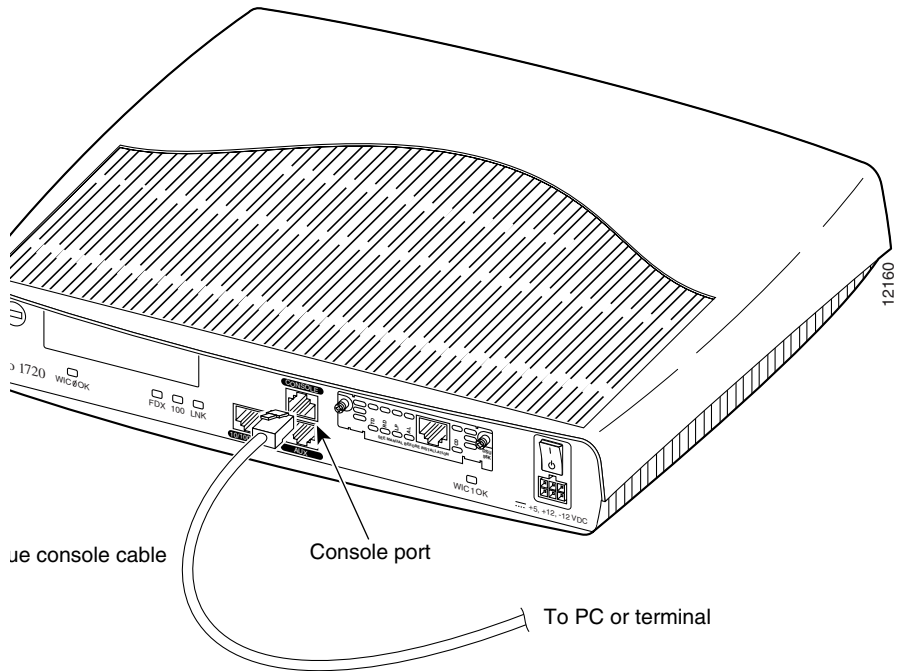
If you want to configure the router using the Cisco IOS command-line interface, you must connect the router console port to a terminal or PC. The cable and adapter required for this connection are included with the router.

To configure the router with a PC, the PC must have some type of terminal emulation software installed. The software should be configured with the following parameters: 9600 baud, 8 data bits, no parity bits, 1 stop bit. Refer to the *Cisco 1700 Router Software Configuration Guide* that came with your router for detailed information about configuring the router using Cisco IOS software.

Follow these steps to connect the router to a terminal or PC:

- Step 1** Connect the blue console cable to the blue CONSOLE port on the router, as shown in [Figure 2-5](#).
- Step 2** Use the correct adapter to connect the other end of the cable to the terminal or PC. If your terminal or PC has a console port that does not fit the adapter included with the router, you must provide the correct adapter for that port.

Figure 2-5 **Connecting the Console Cable to the Router**



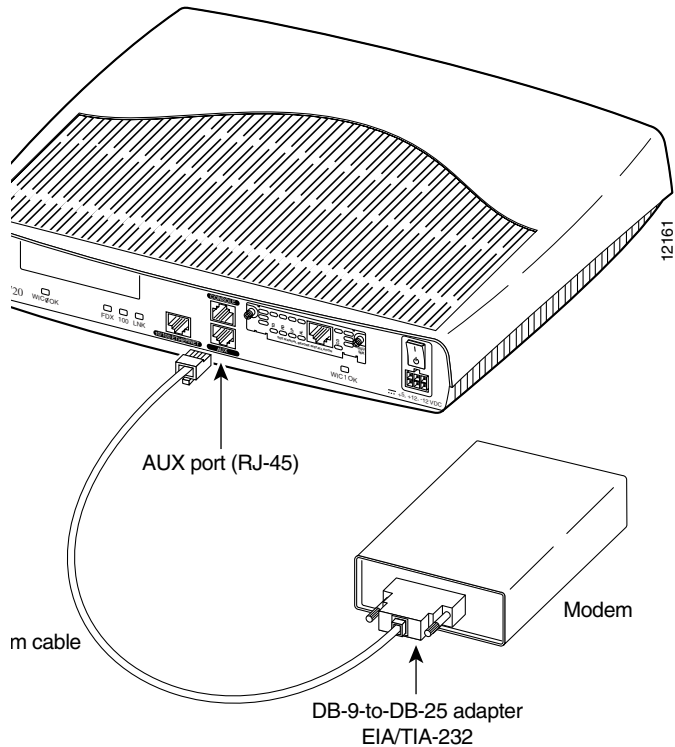
Connecting a Modem

When a modem is connected to the auxiliary port, a remote user can dial into the router and configure it. You can use the blue console cable that came in the accessory kit or (if you are using the blue cable with the console port) you can use any crossover RJ-45-to-RJ-45 cable.

Take the following steps to connect a modem to the router:

- Step 1** Connect one end of the cable to the black AUX port on the router rear panel.
- Step 2** Connect the gray adapter labeled MODEM to the other end of the cable.
- Step 3** Connect the DB-25 end of the adapter to the modem.

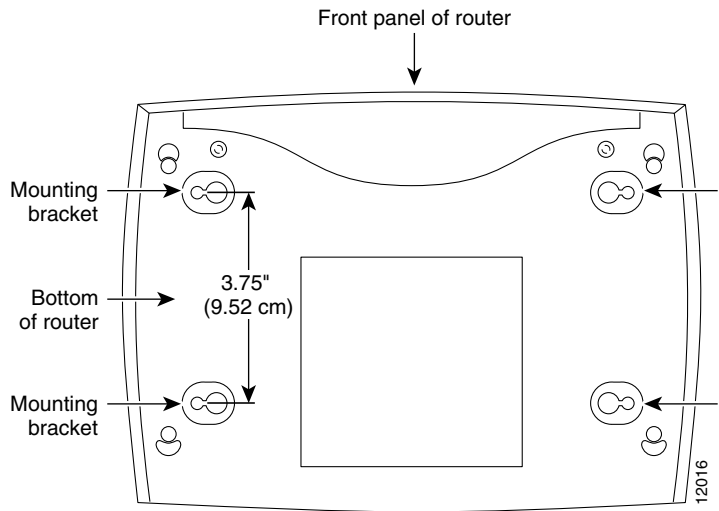
Figure 2-6 *Connecting a Modem to the Router*



Wall-Mounting

The Cisco 1700 router can be wall-mounted using two number 6, 3/4-inch screws and the molded mounting brackets on the bottom of the hub. You must provide the screws. We recommend using pan-head or round-head screws.

Figure 2-7 *Wall-Mount Brackets—Bottom of Router*



To mount the router on a wall or other surface:

- Step 1** Install the two screws 3.75 inches (9.52 centimeters) horizontally apart on a wall or other vertical surface.

The screws should protrude 0.25 inches (0.64 centimeters) from the surface of the wall.

Step 2 Hang the router on the screws with either the left side or right side mounting brackets so that:

- The LEDs are visible to the user—The LEDs indicate the router operating status, so the LEDs should be easily visible.
- The power supply does not hang from its cable—If the power supply is not supported, it might disconnect from the cable that connects it to the router.



Caution

If you install the screws in drywall, use hollow wall anchors (1/8 inch by 5/16 inch) to secure the screws. If the screws are not properly anchored, the strain of the cables connected to the router rear-panel connectors could pull the router from the wall.



Troubleshooting

Use the information in this chapter to help isolate problems you might encounter with the Cisco 1700 router or to rule out the router as the source of the problem.

This chapter contains the following sections:

- [Contacting Cisco or Your Reseller](#)
- [Recovering a Lost Password](#)
- [Problem Solving](#)
- [Troubleshooting ISDN](#)

Contacting Cisco or Your Reseller

If you cannot locate the source of a problem, contact your local reseller for advice. Before you call, you should have the following information ready:

- Chassis type and serial number
- Maintenance agreement or warranty information
- Type and version number of the Cisco IOS installed on your router
- Date you received the router
- Brief description of the problem
- Brief description of the steps you have taken to isolate the problem
- Output from the **show tech-support** command

Recovering a Lost Password

This section describes how to recover a lost enable or enable secret password. The process of recovering a password consists of the following major steps:

- [Change the Configuration Register](#)
- [Reset the Router](#)
- [Reset the Password](#) (for lost enable secret passwords only)
- [Reset the Configuration Register Value](#)

**Note**

See the “Hot Tips” section on Cisco Connection Online (CCO) for additional information on replacing enable secret passwords.

Change the Configuration Register

- Step 1** Connect an ASCII terminal or a PC running a terminal-emulation program to the CONSOLE port on the rear panel of the router. Refer to the section [“Connecting a PC”](#) in the [“Installing the Cisco 1700 Router”](#) chapter.
- Step 2** Configure the terminal to operate at 9600 baud, 8 data bits, no parity, and 1 stop bit.
- Step 3** Reboot the router by pressing the power switch to the OFF position, then to the ON (I) position.

- Step 4** At the user EXEC prompt (Router>), enter the **show version** command to display the existing configuration register value (shown in bold at the bottom of this example output):

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-BNOR2SY56I-M),
Experimental Version 12.0(19980725:020859)
[aiyagari-devtest_0724 100]
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Fri 24-Jul-98 19:09 by aiyagari
Image text-base: 0x80008084, data-base:
0x8084356C
```

```
ROM: System Bootstrap, Version
11.3(19980612:045022)
[rochen-v35-rommon-release-devtest 101],
INTERIM SOFTWARE
```

```
Router uptime is 15 minutes
System restarted by power-on
Running default software
```

```
cisco 1720 (MPC860) processor (revision 0x00)
with 22119K/2457K bytes of memory.
Processor board ID 0000 (1314672220), with
hardware revision 0000
M860 processor: part number 0, mask 32
Bridging software.
X.25 software, Version 3.0.0.
1 FastEthernet/IEEE 802.3 interface(s)
1 Serial(sync/async) network interface(s)
32K bytes of non-volatile configuration
memory.
4096K bytes of processor board System flash
(Read/Write)
```

Configuration register is 0x0

- Step 5** Record the setting of the configuration register. It is usually 0x2102 or 0x102.
- Step 6** Record the break setting.
- Break enabled—bit 8 is set to 0.
 - Break disabled (default setting)—bit 8 is set to 1.

**Note**

To enable break, enter the **config-register 0x01 EXEC** command.

Reset the Router

Step 1 Do one of the following:

- If break is enabled, go to [Step 2](#).
- If break is disabled, turn the router OFF, wait 5 seconds, and turn it ON again. Within 60 seconds, press the **Break** key. The terminal displays the ROM monitor prompt. Go to [Step 3](#).

**Note**

Some terminal keyboards have a key labeled Break. If your keyboard does not have a Break key, refer to the documentation that came with the terminal for instructions on how to send a break. To send a break in Windows HyperTerminal, enter Ctrl-Break.

Step 2 Send a break. The terminal displays the following prompt:

```
rommon 2>
```

Step 3 Enter **confreg 0x142** as follows to reset the configuration register:

```
rommon 2> confreg 0x142
```

Step 4 Initialize the router by entering the **reset** command:

```
rommon 2> reset
```

The router resets, and the configuration register is set to 0x142. The router boots the system image in Flash memory, and displays the following:

```
--- System Configuration Dialog ---
```

Step 5 Enter **no** in response to the prompts until the following message is displayed:

Press RETURN to get started!

- Step 6** Press **Return**. The following prompt appears:

```
Router>
```

- Step 7** Enter the **enable** command to enter privileged EXEC mode. Configuration changes can be made only in this mode:

```
Router> enable
```

The prompt changes to the privileged EXEC prompt:

```
Router#
```

- Step 8** Enter the **show startup-config** command to display an enable password in the configuration file:

```
Router# show startup-config
```

If you are recovering an enable password, skip the following “[Reset the Password](#)” section and complete the password recovery process by performing the steps in the next section, “[Reset the Configuration Register Value](#).”

If you are recovering an enable secret password, it is not displayed in the **show startup-config** command output. Complete the password recovery process by performing the steps in the following “[Reset the Password](#)” section.

Reset the Password

- Step 1** Enter the **configure terminal** command to enter configuration mode:

```
Router# configure terminal
```

- Step 2** Enter the **enable secret** command to reset the enable secret password in the router:

```
Router(config)# enable secret gobbledegook
```

Step 3 Enter the **config-register** command and the original configuration register value that you recorded in [Step 5](#).

Step 4 Press **Ctrl-Z** to exit configuration mode.

```
Router(config)# Ctrl-Z
```

Step 5 Save your configuration changes:

```
Router# copy running-config startup-config
```

Reset the Configuration Register Value

Once you have recovered or reconfigured a password

Step 1 Enter the **configure terminal** command to enter configuration mode:

```
Router# configure terminal
```

Step 2 Enter the **config-register** command and the original configuration register value that you recorded in [Step 5](#).

Step 3 Press **Ctrl-Z** to exit configuration mode:

```
Router(config)# Ctrl-Z
```

Step 4 Reboot the router, and enter the recovered password.

Problem Solving

The key to problem solving is to isolate the problem to a specific subsystem by comparing what the router is doing to what it should be doing.

When problem solving, consider the following subsystems of the router:

- WAN interface cards—Refer to the LEDs on the cards and the LEDs on the router front panel to help identify a failure. For more information on WAN interface cards, refer to the *Cisco WAN Interface Cards Hardware Installation Guide* that comes with each card.
- Cables—Check all the external cables that connect the router to the network.

- Power system—Check the external power source, power cable, router power supply, and circuit breaker. Check for inadequate ventilation or air circulation that might cause overheating.
- ISDN configuration—Consider ISDN-specific hardware and software configurations (ISDN BRI WAN interface cards only).

OK LED Diagnostics

Use the front-panel OK LED to determine any problems with the router. When the router first boots up, it performs a power-on self-test (POST). If the router detects a problem during the POST, the OK LED blinks in a different patterns (described in [Table 3-1](#)) depending on the problem. A pattern consists of a specific number of blinks that is repeated until the router is turned off. If the router experiences any of these problems, contact your Cisco reseller.

Table 3-1 *OK LED Blinking Patterns*

Number of Blinks	Meaning
2	The 860T dual-port random-access memory (DPRAM) failed.
3	The parameter RAM area of the 860T DPRAM failed.
4	The 860T system protection control register has a write failure.
5	The router cannot detect the dynamic random-access memory (DRAM).
6	The user programmable machine has a write failure.
9	The router DRAM failed.

Troubleshooting WAN Interface Cards and Cables

Use the **show diag** command to help determine problems with a card. [Table 3-2](#) lists problems that could occur with the WAN interface cards and the possible causes of these problems.

Table 3-2 Troubleshooting WAN Interface Cards

Symptom	Possible Cause(s)
Router does not recognize WAN interface card	- Confirm that the Cisco IOS software version installed in the router supports the WAN interface card. The <i>Cisco WAN Interface Cards Hardware Installation Guide</i> lists the software requirements for each card. - Make sure that the card is correctly installed in the router. Refer to the “Installing WAN Interface Cards” section in the “Installing the Cisco 1700 Router” chapter. - Use the show diag command to display information about the card: <pre> Router# show diag Slot 0: C1700 1FE Mainboard port adapter, 2 ports Port adapter is analyzed Port adapter insertion time unknown Hardware revision 0.0 Board revision UNKNOWN Serial number 1314672220 Part number 00-0000-00 Test history 0x0 RMA number 00-00-00 EEPROM format version 1 EEPROM contents (hex): 0x20: 01 B2 00 00 4E 5C 4E 5C 00 00 00 00 00 00 00 00 0x30: 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00 WIC Slot 0: Serial 1T WAN daughter card Hardware revision 1.1 Board revision E0 Serial number 7131279 Part number 73-1775-02 Test history 0x0 RMA number 00-00-00 Connector type Wan Module EEPROM format version 1 EEPROM contents (hex): 0x20: 01 02 01 01 00 6C D0 8F 49 06 EF 02 00 00 00 00 0x30: 70 00 00 00 98 01 23 01 FF FF FF FF FF FF FF FF </pre>
Router recognizes the WAN interface card(s), but the card port(s) do not initialize.	- Make sure that the card is correctly installed in the router. Refer to the “Installing WAN Interface Cards” section in the “Installing the Cisco 1700 Router” chapter. - Check the external cable connections to make sure they are secure.
Router does not boot properly or continuously or intermittently reboots.	Make sure that the WAN interface card is correctly installed in the router. Refer to the “Installing WAN Interface Cards” section in the “Installing the Cisco 1700 Router” chapter.

Table 3-2 **Troubleshooting WAN Interface Cards (Continued)**

Symptom	Possible Cause(s)
Router boots, but the console screen is frozen.	• Make sure the console cable is securely connected to the router and to the PC or terminal. • Verify that the parameters for your terminal are set to the following: — 9600 baud — 8 data bits — No parity generated or checked — 1 stop bit
Router powers on and boots only when a particular WAN interface card is removed from the router.	• Confirm that the Cisco IOS software version installed in the router supports the WAN interface card. The <i>Cisco WAN Interface Cards Hardware Installation Guide</i> lists the software requirements for each card. • The router might be overheating. Contact your Cisco reseller.
Router powers on and boots only when a particular cable is disconnected.	There might be a problem with the WAN interface card or card cables. Consult your Cisco reseller for warranty information.

Troubleshooting the Power System

If the router external power supply fails, it should be returned to your Cisco reseller. [Table 3-3](#) list symptoms and possible causes of power problems.

Table 3-3 **Troubleshooting the Power System**

Symptom	Possible Cause(s)
Router shuts down after being on a short time.	• Make sure that the area in which the router is installed meets the environmental site requirements in the “Technical Specifications” appendix later in this guide and in the “Site Requirements” section in the <i>Regulatory Compliance and Safety Information for the Cisco 1700</i> that came with your router. • If the front-panel PWR LED is not on, the power supply has failed.
The router attempts to boot, but all LEDs remain off.	The power supply has failed.
The router is on, but the front-panel PWR LED is off.	The power supply has failed.

Table 3-3 Troubleshooting the Power System

Symptom	Possible Cause(s)
The front-panel PWR LED is on, the front-panel OK LED is off, and the router does not pass console or EIA data.	The power supply has failed.

Troubleshooting ISDN

Because ISDN uses many variables and supports many different configurations, it sometimes can cause problems for the router. This section describes problems related to the ISDN line that might occur.

Two commands are useful when troubleshooting ISDN:

- For routers with an ISDN S/T WAN interface card, enter the **clear interface** command to terminate any active ISDN calls and to reset the ISDN BRI interface. Do this for each ISDN port installed in the router:

```
Router# clear interface bri0
Router# clear interface bri1
```

- For routers with an ISDN U WAN interface card(s), use the **clear controller** command to terminate any active ISDN calls, to reset the ISDN BRI interface, and to reset the ISDN line between the router and the central office switch. Do this for each ISDN port installed in the router:

```
Router# clear controller bri0
Router# clear controller bri1
```

Table 3-4 lists troubleshooting methods for ISDN-specific problems that might occur.

Table 3-4 **Troubleshooting ISDN**

WAN Interface Card	Symptom(s)	Check the Following	Possible Causes
ISDN S/T	Router is on, but OK LED on card is off.	• Is the OK LED on the router front panel on?	• If no, the router might be malfunctioning. Contact your Cisco reseller.
		• Are all ISDN cables properly connected?	• If yes, the ISDN line might be malfunctioning. Check with your ISDN service provider.
		• Is the NT1 on?	• If no, the NT1 might be malfunctioning.
ISDN U	Router is on, but the NT1 LED on card is off.	• Is the OK LED on?	• If no, the router might be malfunctioning. Contact your Cisco reseller.
		• Are all ISDN cables properly connected?	• If yes, the ISDN line might be malfunctioning. Check with your ISDN service provider.
		• Is the ISDN line connected to the card ISDN U port?	• If yes, the ISDN line might be malfunctioning. Check with your ISDN service provider.

Table 3-4 Troubleshooting ISDN (Continued)

WAN Interface Card	Symptom(s)	Check the Following	Possible Causes
ISDN S/T or ISDN U	Card cannot make a connection to the remote router.	Use show isdn status command to check the following:	
		Does the current ISDN switch type match actual switch type being used?	Use the isdn switch-type command to configure correct switch type.
		Is Layer 1 status deactivated?	Use the show controller bri0 command to check for the messages CO RUNNING LOOPBACK TESTS or CO TESTING. If you receive these messages, contact the service provider.
		If Layer 1 status is active, does Layer 3 status say “2 Active Layer 3 calls”?	Router might have called itself. Check destination phone number configured with the dialer map command or the dialer string command.
		If Layer 1 status is active, does Layer 3 status say “No Active Layer 3 call(s)”?	Check destination phone number and make sure it matches the remote router phone number. Check route to the destination and make sure it matches the remote router network address.
		If Layer 1 status is active, does Layer 3 status say “1 Active Layer 3 call”?	Check router protocol configurations.



Technical Specifications

Table A-1 lists hardware and operating specifications for the Cisco 1700 router.

Table A-1 Router Specifications

Description	Specification
Console port	RJ-45
Auxiliary port	RJ-45
Ethernet port	RJ-45
Dimensions	
H x W x D	3.1 x 11.2 x 8.7 in. (7.85 x 28.4 x 22.1 cm)
Weight	2.6 lbs (1.18 kg)
With two WAN interface cards	2.9 lbs (1.32 kg)
Power supply	
External	Universal AC/DC switching—Supplies +5V, +12V, and –12V
On-board	Supplies 3.3V and -5V
Power consumption	15W
Operating Specifications	
Operating temperature	32 to 104° F (0° to 40°C)
Storage temperature	-4 to 149° F (-20° to 65°C)
Operating humidity	10 to 85%, noncondensing





Cabling Specifications

This appendix describes cables and cabling guidelines for the Cisco 1700 router and contains the following sections:

- [Ethernet Cables](#)
- [Ethernet Network Cabling Guidelines](#)
- [Console Cable and Adapters](#)



Note

For information about cables used with Cisco WAN interface cards, refer to the *Cisco WAN Interface Cards Hardware Installation Guide* that comes with each of the cards.

Ethernet Cables

This section describes the Ethernet cables that are used to connect the router to your local Ethernet network. A 10/100BaseTX router, like the Cisco 1700 router, requires Category 5 unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable.

**Table B-1 *Straight-Through Ethernet Cable
(RJ-45-to-RJ-45) Pinouts***

RJ-45 Pin ¹	Signal	Direction	RJ-45 Pin
1	TX+	—>	1
2	TX–	—>	2
3	RX+	<—	3
6	RX–	<—	6

1.Pins 4, 5, 7, and 8 are not used for signaling.

Ethernet Network Cabling Guidelines

Table B-2 describes some guidelines for creating Ethernet networks. Figures might vary, depending on the manufacturer of the network equipment.

Table B-2 **Ethernet Cabling Guidelines**

Specification	10BaseT	100BaseTX
Maximum segment length	100 meters	100 meters
Maximum number of segments per network	5	• With Class I repeaters: 1 • With Class II repeaters: 2
Maximum hop count ¹	4	• With Class I repeaters: none • With Class II repeaters: 1
Maximum number of nodes per segment	1024	1024
Cable type required	UTP Category 3, 4, or 5	UTP Category 5 or STP

1. Hop count = Routing metric used to measure the distance between a source and a destination.

Console Cable and Adapters

A console cable kit is provided with your router. Use this kit when connecting your router to a PC or terminal.

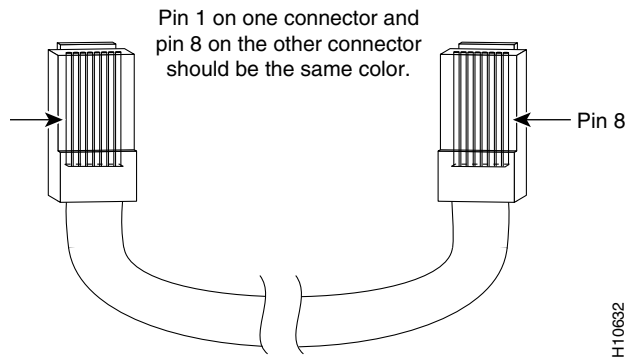
The console cable kit contains:

- RJ-45-to-RJ-45 console cable (blue)
- RJ-45-to-DB-9 adapter (gray)

Table B-3 describes the wiring for the console port, the console cable, and the included adapters. This table also includes pinouts for an RJ-45-to-DB-25 adapter. Figure B-1 illustrates how to identify the console cable, which is also referred to as a *rollover* cable.

Table B-3 Console Cable and Adapter Pinouts

Console (DTE)	Console Port	Console Cable	Adapter	Adapter	Terminal (DTE)
Signal	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	DB-25 Pin	Signal
RTS	1	8	8	5	CTS
DTR	2	7	6	6	DSR
TXD	3	6	2	3	RXD
GND	4	5	5	7	GND
GND	5	4	5	7	GND
RXD	6	3	3	2	TXD
DSR	7	2	4	20	DTR
CTS	8	1	7	4	RTS

Figure B-1 Identifying a Rollover Cable



Installing and Upgrading Router Memory

This chapter describes how to install or upgrade memory in your Cisco 1700 router and includes the following sections:

- [Opening the Chassis](#)
- [Locating Memory](#)
- [Installing a Mini-Flash Module](#)
- [Installing a DIMM](#)
- [Closing the Chassis](#)



Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the router. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

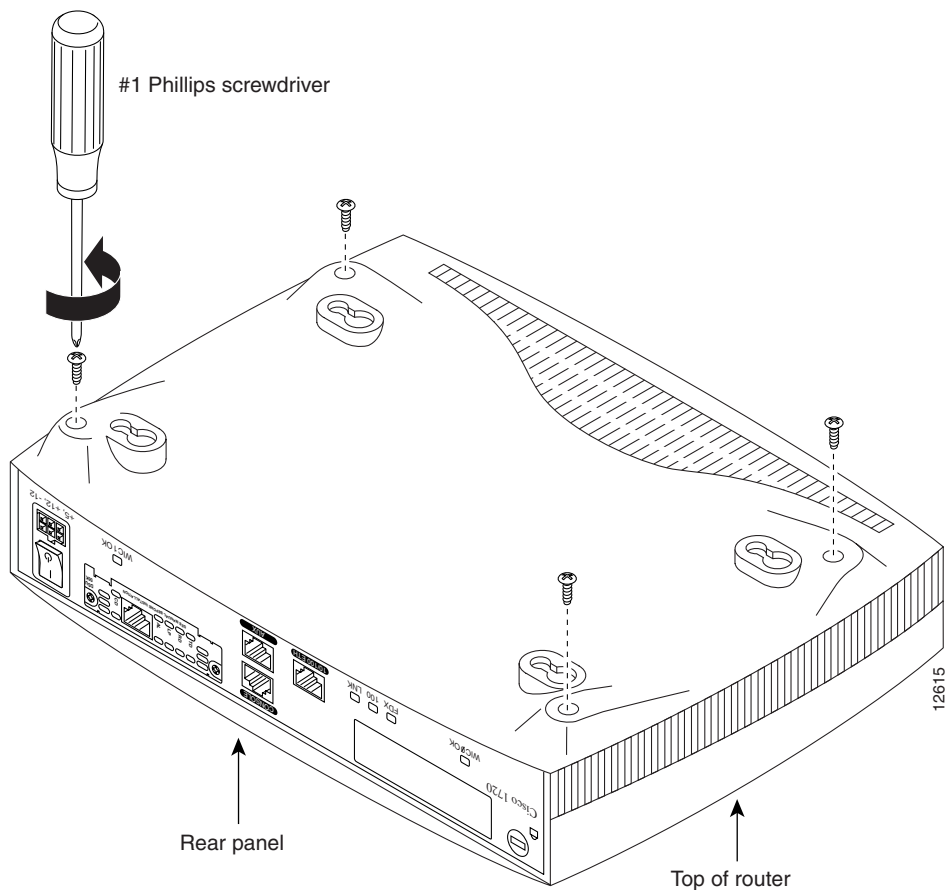
Opening the Chassis

In order to upgrade Cisco 1700 router memory, you must open the chassis. Opening the chassis requires a number one Phillips screwdriver.

Follow these steps to open the chassis:

- Step 1** Make sure the router is turned OFF and is disconnected from the power supply.
- Step 2** Turn the router upside down, and rest the top of the router on a flat surface.
- Step 3** Use the Phillips screwdriver to remove the four screws that hold the top and bottom of the chassis together, as shown in [Figure C-1](#).
- Step 4** Turn the router back to its original position (right-side up).

Figure C-1 Removing the Chassis Screws



- Step 5** Gently pull the top of the router (which is facing up toward you) up and away from the bottom of the router (which is resting on the flat surface).

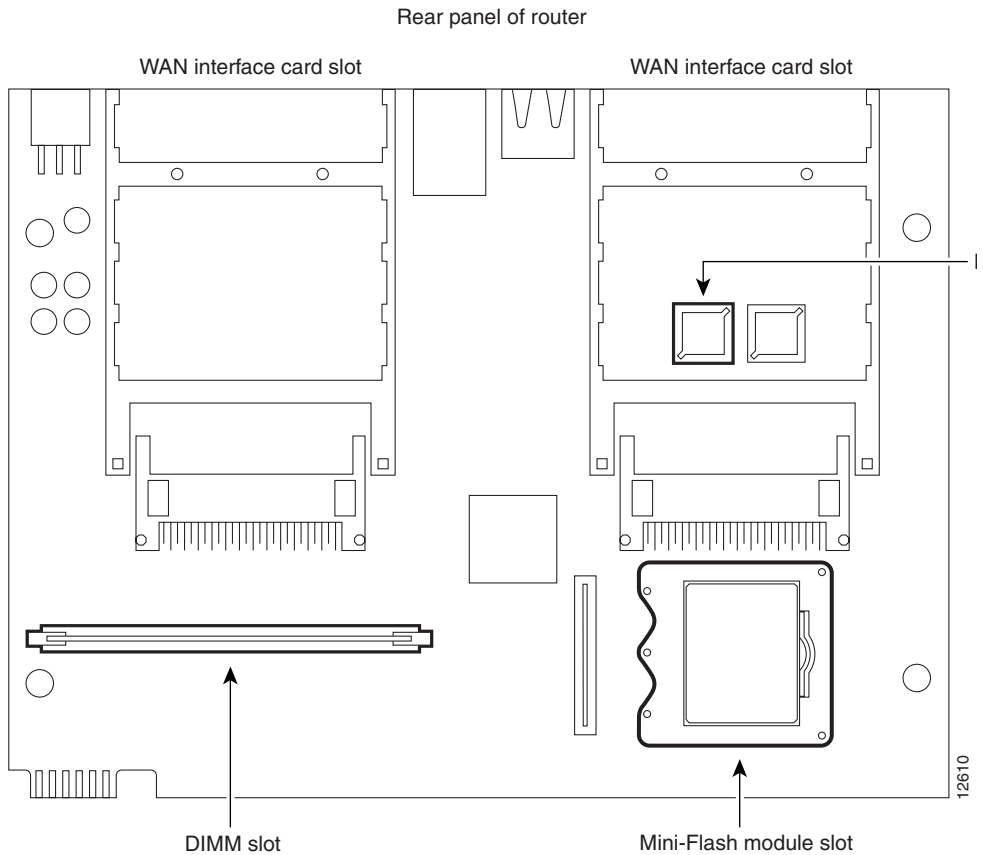
At this point, you might have to disconnect the fan, which is inside the top of the router chassis, from the motherboard. Do this by disconnecting the fan cable from the connector (labeled FAN) on the motherboard.

- Step 6** Place the router bottom on an anti-static mat and begin installing memory.

Locating Memory

Figure C-2 shows where to install DIMMs and mini-Flash modules on the router motherboard.

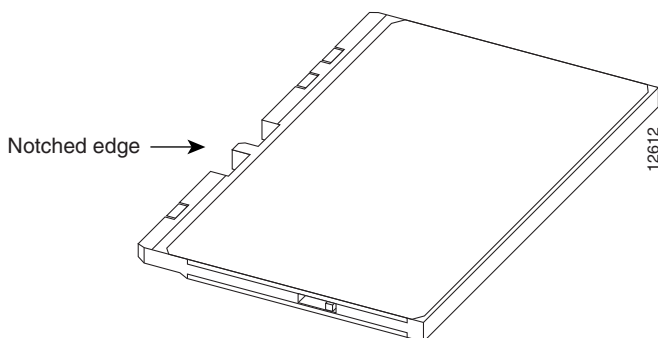
Figure C-2 Cisco 1700 Motherboard—Memory Locations



Installing a Mini-Flash Module

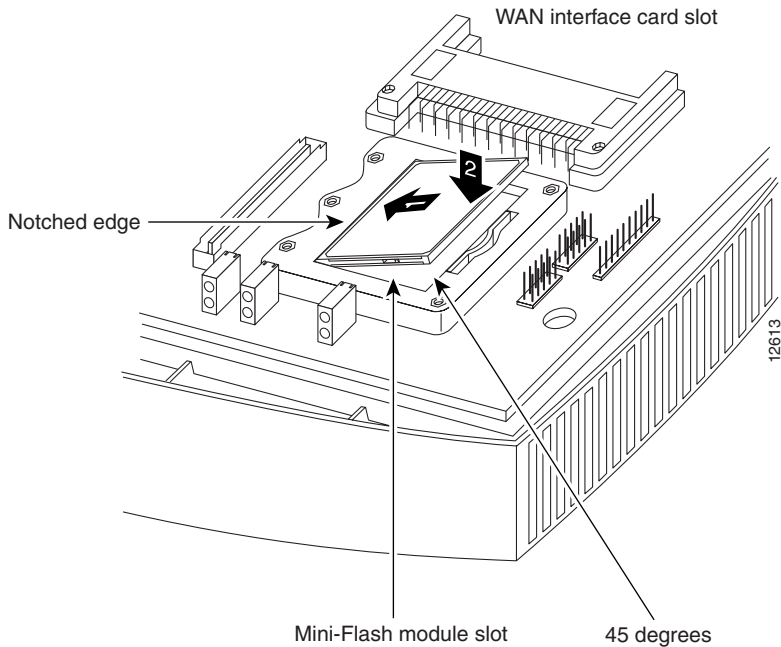
You can install a mini-Flash module (shown in [Figure C-3](#)) to increase the amount of Flash memory in the router.

Figure C-3 **Mini-Flash Module**



Take the following steps to install a mini-Flash module on the motherboard:

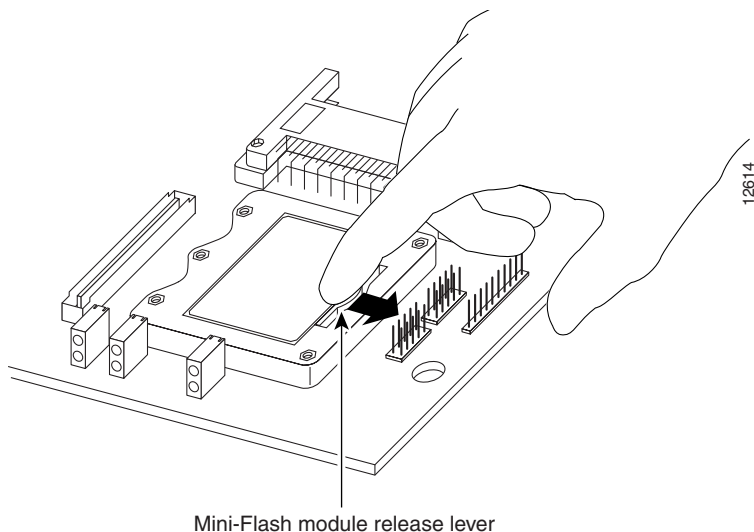
- Step 1** Locate the module slot on the motherboard, shown in [Figure C-2](#).
- Step 2** Hold the module with the notched edge away from you.
- Step 3** Insert the module into the module slot at a 45-degree angle, as shown in [Figure C-4](#).
- Step 4** Press down firmly on the module until you hear a clicking sound and the module is firmly inserted in the slot.

Figure C-4 *Installing a Mini-Flash Module*

Removing a Mini-Flash Module

Take the following steps to remove a mini-Flash module:

- Step 1** Insert your index finger between the mini-Flash module and the mini-Flash module release lever, as shown in [Figure C-5](#).
- Step 2** Firmly pull the release lever away from the module until the module pops up and away from the module slot.

Figure C-5 **Removing a Mini-Flash Module**

Installing a DIMM

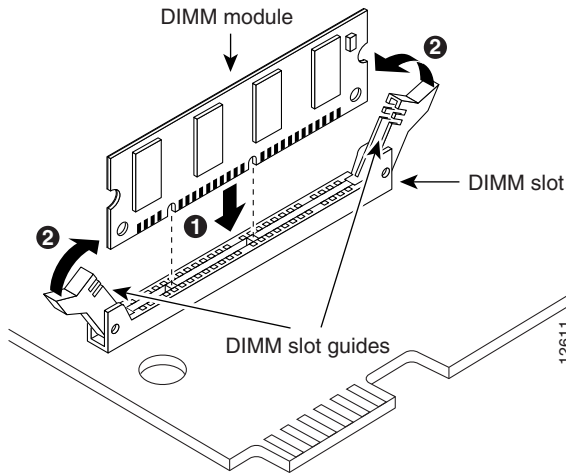
You can install a dual inline memory module (DIMM) to increase the amount of dynamic random-access memory (DRAM) in the router.

Take the following steps to install a DIMM on the router motherboard.

- Step 1** Locate the DIMM slot on the motherboard, shown in [Figure C-2](#).
- Step 2** Remove any existing DIMM by pulling the DIMM slot guides (shown in [Figure C-6](#)) away from the DIMM and down towards the motherboard.
- Step 3** Hold the replacement DIMM with the notched edge away from you and facing the router.
- Step 4** Insert the DIMM into the DIMM slot, making sure that the notches on the edge of the DIMM are inserted over the bars inside the DIMM slot, as in [Figure C-6](#).

- Step 5** Firmly press the DIMM into the slot until the two DIMM slot guides on each side of the slot move up and over the end of the DIMM, as in [Figure C-6](#). If the guides do not move up over the edge of the DIMM, move them with your hands.

Figure C-6 *Installing a DIMM*



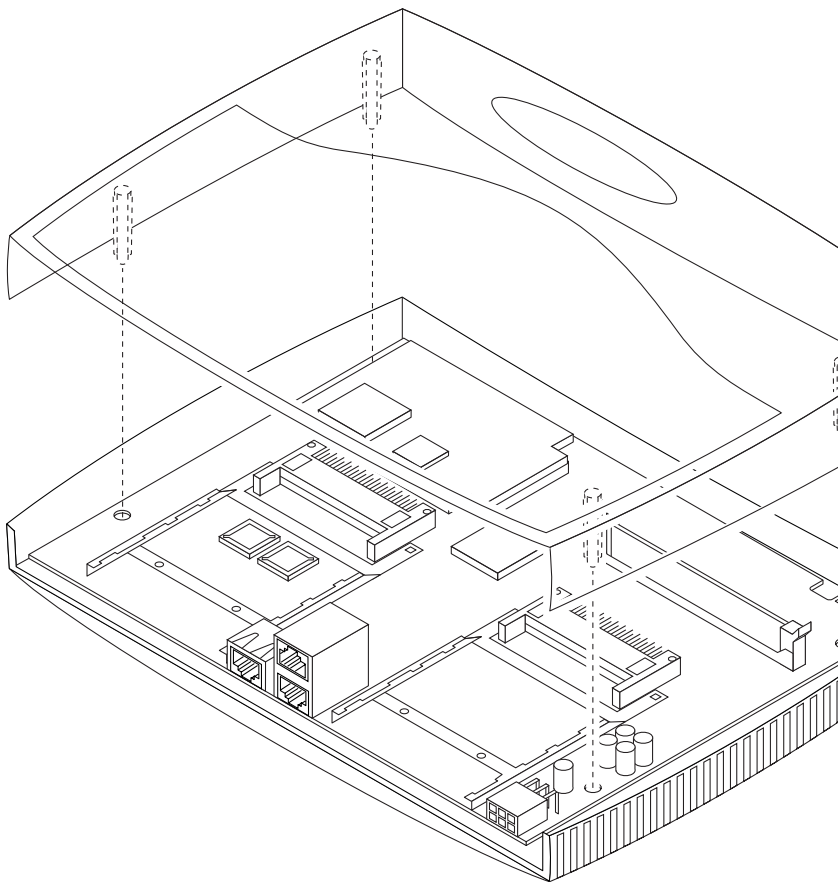
Closing the Chassis

After installing memory on the motherboard, close the chassis by following these steps:

- Step 1** If you disconnected the fan from the motherboard as described in the [“Opening the Chassis”](#) section, reconnect the fan cable to the connector labeled FAN on the motherboard.
- Step 2** Locate the posts that protrude from the inside of the chassis cover and corresponding openings on the chassis bottom.

- Step 3** Line up the posts with the corresponding openings, as shown in [Figure C-7](#), and carefully slide the posts into the openings, taking caution not to damage the router motherboard with the posts.
- Step 4** Replace the screws that you removed when opening the chassis. (See [Figure C-1](#).)

Figure C-7 Closing the Chassis





Ordering and Configuring an ISDN Line

This appendix describes how to order and configure an Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) line for use with a Cisco 1700 router with an ISDN BRI WAN interface card installed.

This appendix contains the following sections:

- [ISDN BRI Line Configuration Requirements](#)
- [ISDN BRI Switch Types](#)
- [ISDN BRI Provisioning by Switch Type](#)
- [Defining ISDN Service Profile Identifiers](#)
- [ISDN Configuration Options](#)

ISDN BRI Line Configuration Requirements

Before using a Cisco 1700 router with an ISDN BRI WAN interface card installed, you must order a correctly configured ISDN BRI line from your local telecommunications service provider.

This process varies dramatically from provider to provider on a national and international basis. However, following are some general guidelines:

- Ask for two channels to be called by one number.
- Ask for delivery of calling-line identification. This is also known as *caller ID* or *automatic number identification* (ANI).

- If the router is going to be the only device attached to the ISDN BRI line, ask for point-to-point service and a data-only line.
- If you will be connecting another ISDN device (such as an ISDN telephone) to the ISDN BRI line, ask for point-to-multipoint service (subaddressing is required) and a voice-and-data line.

ISDN BRI Switch Types

ISDN BRI supports a variety of service provider switches. [Table D-1](#) lists, by geographic areas, the ISDN switch types supported by a Cisco 1700 router ISDN BRI interface. Use the **isdn switch-type** command followed by the corresponding keyword. You must reboot the router after entering this command for the change to take effect.

Table D-1 *ISDN BRI Switch Types*

Switch Type	Keywords
Australia	
TS013 switches	basic-ts013
Europe	
German 1TR6 switches	basic-1tr6
Norway NET3 switches (phase 1)	basic-nwnet3
NET3 ISDN switches (UK and others)	basic-net3
VN2 ISDN switches	vn2
VN3 ISDN switches	vn3
Japan	
NTT switches	ntt
North America	
Basic 5ESS switches	basic-5ess
NT DMS-100 and 5ESS custom switches	basic-dms100
National ISDN-1(NI1) or switches	basic-ni
New Zealand	
Net3 switches	basic-nznet3

ISDN BRI Provisioning by Switch Type

The ISDN BRI line is configured (*provisioned*) for different types of services by the ISDN BRI service provider. The person ordering the ISDN line must also order the provisioning described in this section.

[Table D-2](#) lists the provisioning that should be ordered for the router, based on the switch type.

Table D-2 *ISDN Provisioning by Switch Type*

Switch Type	Provisioning
5ESS Custom BRI	For data only 2 B channels for data Point to point Terminal type = E 1 directory number (DN) assigned by service provider MTERM = 1 Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange
5ESS Custom BRI	For voice and data (Use these values only if you have an ISDN telephone connected.) 2 B channels for voice or data Multipoint Terminal type = D 2 directory numbers assigned by service provider 2 service profile identifiers (SPIDs) required, assigned by service provider MTERM = 2 Number of call appearances = 1 Display = No Ringing/idle call appearances = idle Autohold= no Onetouch = no Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2

Switch Type	Provisioning
5ESS National ISDN (NI1) BRI	Terminal type = A 2 B channels for voice and data 2 directory numbers assigned by service provider 2 SPIDs required; assigned by service provider Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2
DMS-100 BRI	2 B channels for voice and data 2 directory numbers assigned by service provider 2 SPIDs required; assigned by service provider Functional signaling Dynamic terminal endpoint identifier (TEI) assignment Maximum number of keys = 64 Release key = no, or key number = no Ringing indicator = no EKTS = no PVC = 2 Request delivery of calling line ID on Centrex lines Set speed for ISDN calls to 56 kbps outside local exchange Directory number 1 can hunt to directory number 2

Defining ISDN Service Profile Identifiers

An ISDN service provider, usually a telephone company, can offer a variety of services. Many providers use service profile identifiers (SPIDs) to identify the device that is using the ISDN service, similar to the way that the telephone company uses a telephone number to identify your standard telephone service. If you use such a service provider, the provider assigns your ISDN device one or more SPIDs when you first subscribe to the service. Providers use different numbering schemes, but a SPID is usually a seven-digit telephone number, plus some optional numbers.

The provider also assigns your device one or two local directory numbers (LDNs), which function as the router telephone number. The LDN is the number that a remote router dials to make a call to your router.

**Note**

SPIDs have significance only at the local-access ISDN interface. Every router that uses ISDN must be assigned SPIDs (if used by the service provider) by the service provider for that router.

When the router connects to the service provider's central office ISDN switch, it sends the SPIDs to the switch. If the router is not configured with the correct SPIDs, it cannot place or receive calls. Use the **isdn spid** command to define the SPID and the LDN on the router for both ISDN BRI B channels, as follows:

```
Router(config-if)# isdn spid1 spid-number [ldn]
```

```
Router(config-if)# isdn spid2 spid-number [ldn]
```

**Note**

Although the LDN is usually optional, it might be required so that the router answers calls made to the second directory number.

ISDN Configuration Options

For information on how to configure Cisco 1700 router to dial into a central-site router over ISDN, refer to the *Cisco 1700 Router Software Configuration Guide* that came with your router.

For more advanced information on configuring ISDN for Cisco 1700 routers, refer to the chapter “Configuring ISDN” in the *Dial Solutions Configuration Guide* publication, which is on Cisco.com. This document includes information on the following topics:

Snapshot Routing

You can also configure *snapshot routing* for the router ISDN interface. During snapshot routing, the router is configured to bring up the ISDN line, dynamically learn about remote routes, and then take down ISDN line. The router saves the learned routes for a specified period of time, even though routing updates are not exchanged while the ISDN line is down. See the chapter “Configuring DDR” in the *Wide-Area Networking Configuration Guide* publication for detailed information about snapshot routing.

Dial-on-Demand Routing

To place calls on the ISDN interface, you must configure it with dial-on-demand routing (DDR). See the chapter “Configuring DDR” in the *Wide-Area Networking Configuration Guide* publication for detailed information about DDR.

Bandwidth on Demand and Dial Backup

See the chapter “Configuring DDR” in the *Wide-Area Networking Configuration Guide* publication for detailed information about bandwidth on demand and dial backup.



Numerics

5ESS Custom ISDN BRI switch [D-3](#)

5ESS National ISDN 1 (NI1) BRI switch [D-4](#)

A

accessory kit [1-10](#)

adapter, included [1-10](#)

additional required equipment [1-10](#)

ANI

See calling-line identification

Automatic Number Identification

See calling-line identification

auxiliary port

connecting [2-12](#)

description [1-3](#)

specifications [A-1](#)

B

break

enabling [3-4](#)

sending to router [3-4](#)

BRI

See ISDN BRI

C

cables

console pinout [B-4](#)

Ethernet pinout [B-2](#)

included with router [1-10](#)

requirements for Ethernet networks [B-3](#)

serial [1-11](#)

you need to provide [1-10](#)

caller ID

See calling-line identification

calling-line identification [D-1](#)

caution, definition [xi](#)

chassis

closing [C-8](#)

dimensions [A-1](#)

opening [C-2](#)

Cisco, contacting [3-1](#)

closing chassis [C-8](#)

command [D-2](#)

config-register [3-4](#)

configure terminal [3-5, 3-6](#)

copy [3-6](#)

- enable [3-5](#)
- enable secret [3-5](#)
- isdn spid [D-5](#)
- isdn switch-type [D-2](#)
- reset [3-4](#)
- show startup-config [3-5](#)
- show version [3-3](#)
- config-register command [3-4](#)
- configuration register
 - displaying [3-4](#)
 - setting [3-2, 3-4, 3-6](#)
- configure terminal command [3-5, 3-6](#)
- connecting
 - Ethernet cable [2-2](#)
 - power cord [2-8](#)
 - router to a modem [2-12](#)
 - router to a PC [2-11](#)
- console port
 - connecting [2-11](#)
 - description [1-3, 1-4](#)
 - illustration [1-4](#)
 - specifications [A-1](#)
- copy command [3-6](#)

D

- DDR [D-6](#)
- definition
 - caution [xi](#)

- note [xi](#)
- warning [xi](#)

Dial-on-Demand Routing

- See [DDR](#)

DIMM

- installing [C-7](#)
- locating on router [C-4](#)

DMS-100 ISDN BRI switch [D-3](#)

document

- audience [ix](#)
- conventions [xi](#)
- organization [x](#)
- related publications [x](#)

DRAM description [1-8](#)

E

- enable command [3-5](#)
- enable secret command [3-5](#)
- ETH ACT LED description [1-6](#)
- ETH COL LED description [1-6](#)
- Ethernet cable
 - connecting [2-2](#)
 - pinouts [B-2](#)
 - requirements for networks [B-3](#)
- Ethernet port
 - connecting [2-2, 2-3](#)
 - description [1-3, 1-4](#)
 - illustration [1-4](#)

specifications [A-1](#)

F

Flash memory

description [1-8](#)

installing [C-5](#)

locating on router [C-4](#)

front panel

illustration [1-2](#)

LEDs

description [1-6 to 1-7](#)

illustration [1-6](#)

H

hub

connecting to [2-3](#)

description [1-10](#)

I

installing

DIMM [C-7](#)

equipment you provide [1-10](#)

Flash memory [C-5](#)

preparing for [2-1](#)

verifying using LEDs [2-4, 2-10](#)

wall-mounting [2-4](#)

WAN interface cards [2-4](#)

Integrated Services Digital Network

See ISDN BRI

ISDN

See ISDN BRI

ISDN BRI

configuring

bandwidth on demand [D-6](#)

DDR [D-6](#)

dial backup [D-6](#)

requirements [D-1](#)

snapshot routing [D-5](#)

line configuration requirements [D-1](#)

point-to-multipoint service [D-2](#)

point-to-point service [D-2](#)

provisioning [D-3 to D-4](#)

SPID

configuring [D-4](#)

definition [D-4](#)

switch types [D-2](#)

isdn spid command [D-5](#)

isdn switch-type command [D-2](#)

K

Kensington-compatible [1-3](#)

L

LEDs

front panel

description [1-6 to 1-7](#)illustration [1-6](#)OK LED diagnostics [3-7](#)

rear panel

description [1-4](#)illustration [1-4](#)using to verify installation [2-10](#)

M

memory

description [1-8](#)

DIMM

installing [C-7](#)locating on router [C-4](#)displaying amounts [1-9](#)DRAM description [1-8](#)

Flash

description [1-8](#)installing [C-5](#)locating on router [C-4](#)NVRAM description [1-8](#)show version command [1-9](#)

modem

connecting to router [2-12](#)description [1-11](#)support [1-3](#)modem, connecting to router [2-12](#)

Nnote, definition [xi](#)NT1 [1-11](#)NVRAM, description [1-8](#)

O

OK LED

description [1-6](#)diagnostics [3-7](#)opening chassis [C-2](#)operating temperatures [A-1](#)

Ppassword recovery [3-2 to 3-6](#)

PC

adapters for console cable [2-11](#)connecting to router [2-11](#)terminal emulation settings [2-11](#)

pinouts

console cable [B-3](#)Ethernet cable [B-2](#)power, troubleshooting [3-9](#)

power socket

connecting [2-8](#)

illustration [1-4](#)

specifications [A-1](#)

problem solving [3-6](#)

PWR LED description [1-6](#)

R

rear panel

connectors

description [1-4](#)

illustration [1-4](#)

LEDs

description [1-5](#)

illustration [1-4](#)

recovering a lost password [3-2](#)

related publications [x](#)

reset command [3-4](#)

router

unpacking [1-10, ?? to 1-10](#)

S

serial cable description [1-11](#)

service profile identifier

See SPID

show startup-config command [3-5](#)

specifications [A-1](#)

SPID [D-4](#)

configuring [D-5](#)

definition [D-4](#)

switch

connecting to [2-3](#)

description [1-10](#)

T

terminal emulation, settings [2-11](#)

troubleshooting

cables [3-7](#)

contacting Cisco [3-1](#)

password recovery [3-2 to 3-6](#)

power system [3-9](#)

using the OK LED [3-7](#)

WAN interface cards [3-7 to 3-9](#)

U

unpacking the router [1-10, ?? to 1-10](#)

W

wall-mounting [2-14](#)

WAN interface cards

description [1-11](#)

installing [2-6](#)

router slots [1-3](#)

- slot specifications [A-1](#)
- supported cards [1-3](#)
- troubleshooting [3-7 to 3-9](#)
- warning
 - definition [xi](#)
 - jewelry removal [2-4](#)
 - lightning activity [2-2, 2-5](#)
 - read instructions before installing [2-2](#)
 - SELV circuits [2-2](#)
 - telephone-network voltages [2-4](#)
 - trained and qualified personnel [2-4](#)
- WIC0 ACT/CH0 LED description [1-7](#)
- WIC0 ACT/CH1 LED description [1-7](#)